

Inquiry Submittal

Real-Time CALFED Operations Group Decision Support

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Project Description

This Inquiry Submittal represents a request for comments on the development of a Real-Time CALFED Operations Group Decision Support System using Delta hydrodynamics, water quality, and particle tracking simulation models. The product would provide rapid (approximately one-day) turn around of modeling analysis for a range of flow and facilities operation options under to purview of the CALFED Operations (Ops) Group.

Problem Statement/Project Justification

The CALFED Ops Group is charged with determining the most effective way to protect aquatic species for the least water cost within the flexibility provisions of the current Delta standards. Aside from valuable experience and ad hoc modeling, there is currently no systematic way to rapidly evaluate a range of options which could be used to respond to a given set of hydrologic and estuarine ecology conditions.

As an example, during the spring months, the Ops Groups could be asked to determine the best course of action given real-time monitoring data which indicates the presence of special status species (like delta smelt) potentially within the zone of influence of the project pumps. Information available to the Ops group includes:

- real-time fish abundance and distribution data from IEP real-time monitoring
- present and antecedent hydrologic and water quality data
- some knowledge of life-stage behavior of various fishes
- options within the flexibility elements of the standards

Ops Group options within the flexibility elements of the Delta standards:

- pulse flows; (Apr 15-May 15; 28 TAF total)
- Delta Cross Channel closure; (15 days May 21-June 15; 45 days Nov-Jan)
- export limits; (Apr15-May15; 35-45% E/I ratio if ERI is 1.0 to 1.5 MAF)

Each option contains several dimensions including timing, magnitude, and duration which must be determined. Further, applied in combination, each option effects the other to a degree. In combination with operations and biological experience, modeling analysis of judiciously chosen alternatives would be an effective way to identify beneficial actions.

The key question for the Ops Group is: What are the incremental benefits and costs of using pulse flows, and/or export limits, and/or Delta Cross-Channel closure, with the attendant determination of timing, magnitude and duration, on species abundance and distribution?

The proposed Real-Time Operations Group Decision Support System would be designed as a rapid response tool for screening alternative operations and determining an optimal balancing of fisheries benefits and water supply costs. In addition, beneficial feedback would be generated between the Real-Time monitoring program and the proposed modeling system. While subsequent monitoring provides feedback on model performance, modeling can provide feedback on monitoring adequacy. Each can be improved by the other. Specific identification of this feedback process would be a goal of the proposed modeling system.

Coordination With Other Programs

The utility of a real-time Ops Group decision support system depends on coordinated interaction with existing programs for appropriation of the hydrological and biological initial conditions required for reliable forecasting. Present and antecedent river inflows, project exports, structural configurations, and boundary salinity must be rapidly obtained and processed for model input. The latest distribution and relative abundance of aquatic species must also be obtained and rendered as initial conditions for the model. Ultimately, coordination with CALFED Ops is a central goal. The modeling system would be tuned to rapidly translate group hypothesis into modeling analysis and concise, informative outputs amenable to the decision making process.

Major Tasks, Schedule, and Personnel Requirements

The proposed Real-Time Decision Support System can be built incrementally and a usable interim system would be up and running within several months. A fully optimized modeling system will require coordination with data providers for automated data acquisition, development of automated preprocessing software, development of automated output software, development of a user interface, and iterative presentation to and feedback from CALFED Ops. A reliable real-time decision support system would be completed within one year. It is estimated that one to two engineers, under the direction of one senior level engineer would be required for one year completion.

Applicant Qualifications

Chris Enright: *Education:* B.S. in Environmental Resources Engineering (water resources emphasis) from Humboldt State University; M.S. in Civil Engineering from U.C. Davis.
Work Experience: USCOE Hydrologic Engineering Center 1988-1989; California Department of Water Resources 1989-present (Division of Planning Delta Modeling Section 1989-1996, Environmental Services Office Suisun Marsh Planning 1996-present.). Member IEP Estuarine Ecology Team 1990-1996; Member Suisun Ecological Workgroup 1996-present; Member IEP Delta Model Team 1996-present.

Kamyar Guivetchi: *Education:* B.S Civil Engineering, U.C. Davis; Post graduate study in Environmental Engineering, U.C. Davis.
Work Experience: Branch Chief and Program Manager, Suisun Marsh Branch, Environmental Services Office, Department of Water Resources; Chair, Suisun Marsh Technical Advisory Committee; Co-chair IEP Delta Model Team; 12 years experience in Delta and Suisun Marsh hydrodynamics and water quality modeling.

**CALFED BAY-DELTA PROGRAM — CATEGORY III
EXECUTIVE SUMMARY/INQUIRY SUBMITTAL**

- I. Project Title:** EAST ANTIOCH CREEK WETLAND RESTORATION (Phase I)
- Applicant:** Contra Costa County Flood Control and Water Conservation District
c/o Nancy Wenninger, Senior Real Property Agent
255 Glacier Drive
Martinez, CA 94553
Telephone: (510) 313-2227
Facsimile: (510) 313-2333
- II. Project Description:** CCC Flood Control District (CCCFCD) has recently acquired more than 20 acres of marshland along East Antioch Creek near its outfall at the San Joaquin River in the City of Antioch. The East Antioch Creek watershed area includes roughly 7,000 acres or 11 square miles. The focus of this proposal is a 7.5 acre portion of the acquisition which has over time been degraded by loss of tidal flow, litter and dumping. The project's plans call for the marsh to be cleaned up, widened and opened to tidal water flow, providing improved flood control function for the upstream watershed while restoring and preserving important habitat for many wildlife species.

Primary Biological/Ecological Objectives:

- (A) Restore the tidal flow to the marsh so that it can revert to a healthy saline emergent wetland, providing high-quality habitat for fish, waterfowl, shorebirds, and other associated wildlife.
- (B) Increase the size of the wetland by removing onsite rubble and establishing more natural elevation gradients to allow a greater diversity of plant species and a broader range of habitats.
- (C) Reestablish native plant species in the wetland, control competitive weedy plants and improve the quality of adjacent upland habitat to provide refuge for wildlife during high tides.

III. Approach/Tasks/Schedule

TASK	SCHEDULE	ESTIMATED COST
Planning: Define project; complete soil testing and hydrology studies; conduct plant and wildlife species surveys; prepare supplemental EIR.	Jan. '98	\$85,000
Design: Develop project design; secure necessary permits; prepare plans and specs.; advertise and award contracts.	July '98	\$80,000
Construction: Remove rubble and debris; build facilities per plan and replace native vegetation.	July '99	\$300,000
Monitoring: Conduct three-year follow-up monitoring program to determine success/survivability of impacted species.	Oct. '99	\$30,000

- IV. **Justification for Project and Funding by CalFed:** The subject site contains tidal saline emergent wetlands, a priority aquatic habitat for species of concern identified by the CalFed Bay-Delta Program. By increasing the size and improving the quality of the wetland, CCCFCD can improve the marsh's flood control function while also increasing nutrient cycling and foodweb support functions. This project provides an excellent opportunity for building a partnership between a public agency and a non-profit, community-based conservation organization to restore and protect high-quality wetland habitat in an urban area.
- V. **Third Party Impacts:** Upon completion of the project, CCCFCD plans to convey fee title ownership of the land to the City of Antioch. Subsequent maintenance costs will be the City's responsibility.
- VI. **Applicant Qualifications:** A political subdivision of the State of California, CCCFCD has a well-qualified and experienced staff of civil engineers and hydrologists who coordinate and provide technical assistance in the development and implementation of drainage systems throughout Contra Costa County. CCCFCD plans to consult with experts in the field of wetland restoration during planning, design and implementation stages of this project.
- VII. **Monitoring and Data Evaluation:** CCCFCD will comply with the Corps of Engineers' typical requirement of a three-year post-project monitoring program to track the survivability ratio of impacted species on the site. In addition, CCCFCD will investigate the benefits of implementing a water-quality monitoring program in conjunction with the Contra Costa Clean Water Program.
- VIII. **Local Support:** This project conforms with the City of Antioch's General Plan calling for wetlands/open space for the site, and is consistent with the city's Creek Development Policy, aimed at "preserving, restoring and recreating the natural riparian landscape." Mt. Diablo Audubon Society (MDAS), a local chapter of the National Audubon Society, has proposed creating a partnership with CCCFCD and is concurrently submitting a proposal for a "piggybacked" project (Phase II) to assist with the restoration and protection of the subject marsh site. Members of the surrounding community have already demonstrated their support for the project by participating in a volunteer marsh cleanup sponsored jointly by CCCFCD and MDAS in April, 1997.

Coordination with other Programs: Besides cooperation with MDAS as outlined above, CCCFCD will coordinate with the Contra Costa Clean Water Program to monitor water-quality as marsh is reestablished.

Compatibility with CalFed's objectives: This project is consistent with CalFed's goals to restore ecosystem health in a priority habitat within the geographic scope of the proposed Ecosystem Restoration Program Plan.